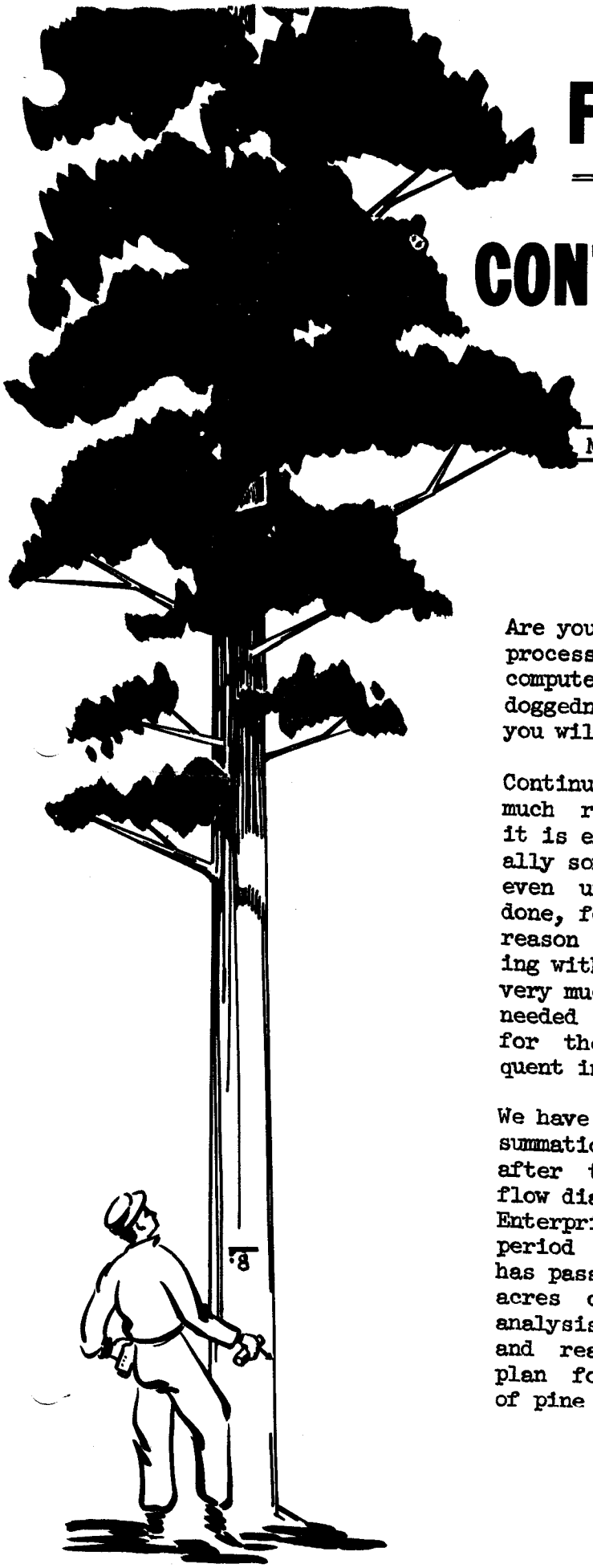
FOREST CONTROL by CONTINUOUS INVENTORY



"Today I have grown taller from walking with the trees."
...Karle Wilson

Milwaukee, Wis. April, 1964 No. 121

IT TAKES TIME TO PLAN FOR ELECTRONIC DATA PROCESSING

Are you preparing to run an electronic data processing job with any of the larger computers? Then, we are told, patience and doggedness are the mental qualifications you will need.

Continuous forest inventory is involved in much realistic detail. Sometimes part of it is exploratory and experimental. Occasionally some of it may be found unnecessary and even unrealistic. But all of it must be done, for one company or another, or for one reason or another. To do this data processing with one of the larger EDP computers, very much preliminary planning time will be needed for the first inventory, less time for the second, and still less for subsequent inventories.

We have decided to distribute a programmer's summation of his actual work plan. Prepared after the development of a systems block flow diagram by the forester, this Menominee Enterprises machine plan covers a working period of 3 months' time. When that time has passed, a 920 plot inventory for 223,000 acres of forest land will be available for analysis. The facts will be in good order and ready for inclusion in the management plan for the finest remaining sawlog stand of pine and hardwoods in Wisconsin.

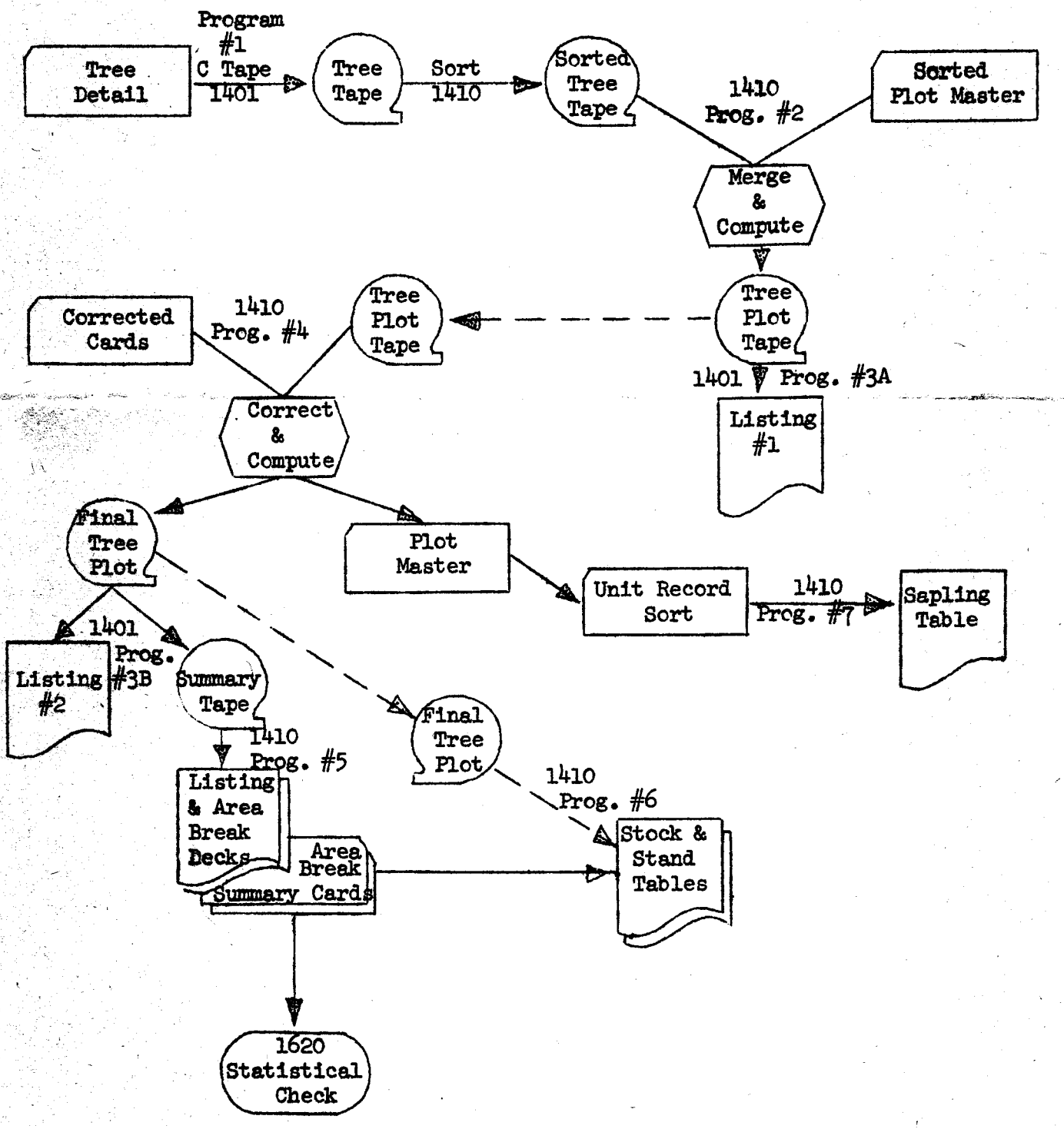
CAL STOTT

The Forester

MENOMINEE INDIAN MILLS
1964

This is a generalized, or broad block diagram explaining the flow of work through computing and compiling processes using the 1401 and 1410 computers with tape. The steps in this summary diagram are explained in succeeding pages. It must be mentioned that these are not the final programming steps but only a summation of them.

Error check programs for the tree detail and sometimes the plot master cards precede these steps. They will be made the subject of a special CFI letter later.



BRIEF EXPLANATIONS OF THE BROAD BLOCK DIAGRAM

Program #1 Card to Tape

Tree detail cards are written on magnetic tape for all future production. The cards are then stored in file drawers. Next, the tape is sorted in plot and tree order.

Production Cost	$ 56.00
Sort Cost	45.00
Total	$101.00

Program #2 Merge and Compute

The plot master cards are merged in ahead of their appropriate tree detail records. At this time all necessary recoding and computation of the tree detail record is completed. The output consists of a complete tape file of all data which will be updated in Program #3.

Production Cost $ 21.00

Program #3AB Preliminary and Final Plot Total Listings of Free Detail Cards

The listings will indicate net volume and basal area for each tree. Plot totals will give tree count, net volume and basal area of cordwood, sawtimber and culls separately for each of the categories; cut, leave, and cut-leave combined.

When the final listing is produced, a summary tape will also be written which will contain all data necessary to create area break tables with per acre and expanded area and volume answers.

Production Cost $168.00

Program #4 Correct and Compute

The corrected error cards are manually sorted and used to update and correct the tape file created in Program #2. The new tape file will consist of all the correct data records and will be considered as the master file. It is created before the final plot total listing is made.

Production Cost $ 21.00

Program #5 Area and Volume Expansions and Per Acre Reductions

Control cards will be used with the summary tape to produce the desired tables and punched out decks. The listing will include the area expansion and the expansion of volumes of cordwood, sawlog, and culls; and the per acre reduction of the tree count volumes and basal area for cordwood, sawlog, and culls.

AREA BREAK TABLES NEEDED

	A	B	C	D	E	F
Type	X	X	X	X	X	X
Size	X	X	X	X	X	X
Density	X	X	X	X	X	X
Understory				X		
Plantability					X	
Site Index						X
Total Forest	X			X	X	X
Operability		X				
Inoperability			X			

Number of Decks = 15
Number of Sorts = 3
Number of Tables = 6

AREA BREAK TABLE PRODUCTION

TABLE	SORT TIME	PRODUCTION TIME	PRINT LINES
A	10 Min.	8 Min.	370
B	None	7 Min.	370
C	None	7 Min.	370
D	None	25 Min.	1870
E	10 Min.	25 Min.	2170
F	10 Min.	25 Min.	1570
Total	30 Min.	1 Hr. 37 Min.	6720

Sort Cost	$ 45.00
Production Cost	138.50
Total	$183.50

Program #6 Stock and Stand Tables

Control cards will be used with area break summary cards and the master tape file to produce the desired tables. Totals for cordwood, sawlog and culls will be given as well as cut and leave totals.

STOCK AND STAND TABLES NEEDED

	AB	C	D	EF	GH	LJ	KL	MN	O	PQ	RS	T	UV	WX
Type	X	X	X			X			X			X		
Size	X	X				X			X			X		
Density	X					X			X			X		
Species	X	X	X	X	X	X	X	X	X	X	X	X	X	X
(Reverse)					R			R			R			R
2" DBH	X	X	X	X	X	X	X	X		X	X		X	X
(Reverse)								R			R			
Risk-Vigor						X	X	X						
Soundness									X	X	X			
Quality												X	X	X
Total Forest	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Operability	X			X	X	X	X	X		X	X		X	X

Number of Sorts = 6 Number of Tables = 24

STOCK AND STAND TABLE PRODUCTION

TABLE	SORT TIME	PRODUCTION TIME	PRINT LINES
AB	25 min.	25 min. x 2	9000 x 2
C	None	25 min.	8100
D	None	17 min.	4320
EF	None	12 min. x 2	1000 x 2
GH	25 min.	12 min. x 2	1000 x 2
LJ	None	25 min. x 2	9000 x 2
KL	None	12 min. x 2	2430 x 2
MN	None	12 min. x 2	2430 x 2
O	25 min.	25 min.	9000
PQ	None	12 min. x 2	2430 x 2
RS	25 min.	12 min. x 2	2530 x 2
T	25 min.	25 min.	9000
UV	None	12 min. x 2	2530 x 2
WX	25 min.	12 min. x 2	2530 x 2
Total	2 hrs. 30 min.	5 hrs. 50 min.	30420 and 34880 x 2

Sort Cost	$215.00
Production Cost	510.00
Total	$725.00

Program #7 Sapling Stock Tables

Plot master cards will be manually sorted in order to produce the sapling table. Totals will be given only for hardwood and conifer saplings.

Production Cost $ 4.00

ITEM	DESCRIPTION	PROGRAMMING VOLUME Card	PROGRAMMING DAYS	PROGRAMMING TEST HR.	MACHINE	TIME
Prog. #1	Card - tape	40,000	1	½ hr.	1401	60'
Sort	7 columns	40,000	-	-	1410	30'
Prog. #2	Merge and compute	40,000	3	1½	1410	15'
Prog. #3AB	Listing #1, #2	40,000	5	2½	1401	3 hrs.
Prog. #4	Correct & compute	1,000	3	1½	1410	15'
Prog. #5	Area break	900	15	8	1410	1½ hrs.
Sort for each Table #5	Total 3 sorts	-	-	-	1410	60'
Prog. #6	Stock and stand	40,000	15	8	1410	6 hrs.
Sort for each Table #6	Total 6 sorts	-	-	-	1410	2½ hrs.
Prog. #7	Sapling table	900	3	1½	1410	5'

Programming Time, 45 man days	$1620.00
Test Time:	
1410	$1745.00
1401	168.00
Total	$1913.00
Production Cost:	
1410	$ 954.50
1401	269.00
Total	$1223.50
Problem definition, systems documentation	$ 340.00
Total Estimated Cost	$5096.00

ESTIMATED TIME SCHEDULE
1964

March 2	Port-A-Punch cards to Data Processing Center in two decks (Tree Detail and Plot Master). Plot master cards will be in order by plot number with identifying X punch in Col. 2.
	Programs 1, 2, and 3A will be run.
March 16	Preliminary listing will be completed and given to foresters for inspection and correction.
March 31	Corrected cards returned to Data Processing Center.
	Programs 4 and 3B will be run.
April 8	Final listing will be released.
April 20-24	Area and volume expansion and per acre reduction tables (six tables).
April 27-May 8	Stock and stand tables (27 tables) and the sapling table.